THE FUTURE OF CANADA'S TRANSPORTATION SYSTEM: HAS CANADA LEARNT FROM ITS EXPERIENCES WITH OUTBREAKS SUCH AS SARS, EBOLA, H1N1 AND MERS?

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Proceedings of the 53rd Annual Conference
Canadian Transportation Research Forum

Introduction

Transportation is clearly important to a trading nation like Canada, but it is not just goods but also people who are crossing our borders is ever larger numbers. The world has seen and reacted to the health implications of travellers during outbreaks of SARS, Ebola, H1N1 and MERS. Has Canada learnt from these experiences and will we be better prepared the next time there is an outbreak?

SARS (2002-2003)

Severe acute respiratory syndrome, commonly known as SARS "was an atypical pneumonia that first appeared in China in late 2002…The World Health Organization (WHO) estimates that 8,096 people were infected, of whom 774 died, implying a case mortality rate of 9.6 percent…Canada was the most affected non-Asian country with 251 cases and 44 deaths, most of these in Toronto".[1]

One very visible response in Canada to SARS was thermal image scanning of passengers as a fever was one of the possible indicators of someone with SARS. Scanners were used from mid-May to mid-December 2003.[2] This visible sign of "doing something" might have been more important in instituting the scanning than any actual health benefits, as can been seen in Table 1.

Table 1 Number of Passengers Detected with an Elevated Temperature by Thermal Image Scanner and Suspected of SARS, Vancouver International and Toronto Pearson Airports, May to November 2003

Airport	Toronto Pearson	Vancouver	Total
Number of passengers scanned	3,920,407	649,352	4,569,759
Number of passengers with an elevated temperature by scanner	1,365 (0.035%)	70 (0.011%)	1,435 (0.031%)
Number of passengers with SARS	0	0	0

Source: Public Health Agency of Canada, Canada Communicable Disease Report, Volume 30, Number 19, October 1, 2004

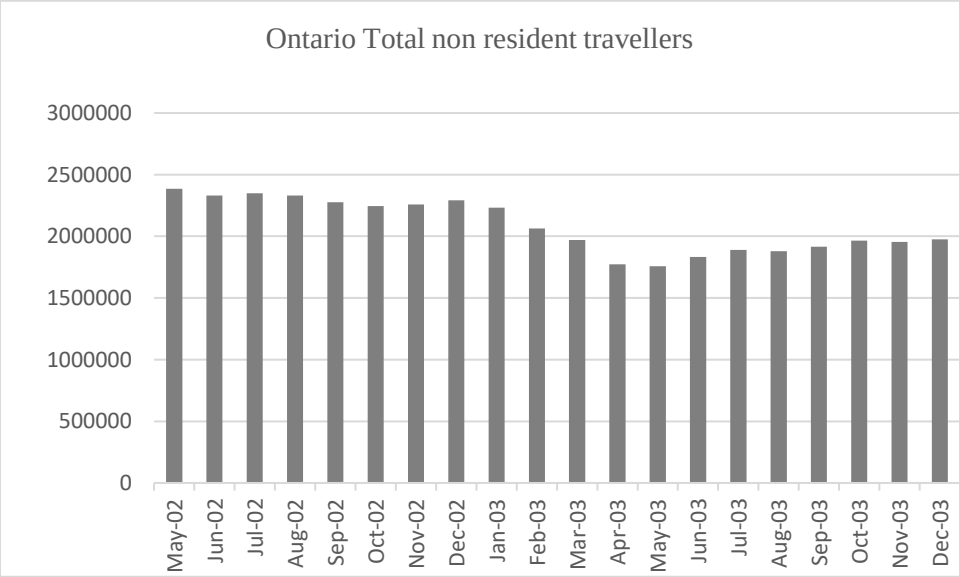
Assessments done post-crisis in 2005 on screening performed in Canada and other countries was not strongly positive: "The effectiveness of temperature screening at points of entry and exit as a control measure to limit between-country transmission is uncertain at present."[3] Of the 251 Canadian SARS cases, "Five of these cases were travellers returning from Asia, only three of whom were symptomatic during their flight" and the last of these travellers entered Canada 1 ½ months before the scanners were put in to the airports in Canada.[4]

During the SARS outbreak, the World Health Organization (WHO) "issued travel advisories directing people around the world to avoid places battling outbreaks…One of the places hit with a travel advisory was Toronto…the Ontario government roundly denounced the WHO for the travel advisory, which emptied hotels and conference centres in Canada's largest city."[5] The travel advisories "almost certainly induced substantial changes in business and leisure travel patterns, and had a major impact on the economies of badly affected regions such as Hong Kong, mainland China, Taiwan, Singapore, and Ontario in Canada."[6]

The Greater Toronto Airport Authority posted a loss of $66.8 million in 2003 where passenger traffic fell 4.6 percent and the SARS outbreak was one of the reasons cited.[7]

The SARS outbreak in Toronto was primarily between March-April 2003 and May-July 2003. The WHO travel advisory was issued on April 23, 2003 advising against traveling to Toronto. It can be seen in Graph 1 that there was a decline in international travellers entering or returning to Canada, with Ontario as the point of entry, during those periods.

Graph 1 Number of international travellers entering or returning to Canada, Ontario province of entry, seasonally adjusted, monthly May 2002-December 2003



Source: Statistics Canada, CANSIM Table 427-0001

Canada was unhappy with the WHO imposed travel ban and "direct and indirect losses estimated at $2 billion" were attributed to the travel advisory.[8]

Infuenza A (H1N1) or Swine Flu (2009-2010)

This type of flu first appeared in Mexico in March 2009.[9] "By the time WHO declared a pandemic in June 2009, a total of 74 countries and territories had reported laboratory confirmed infections" and in time "most countries in the world have confirmed infections from the new virus."[10]

How serious was it? The World Health Organization (WHO) estimated that 18,449 people died from the pandemic outbreak of H1N1 flu in 2009. It is believed that these estimates are low and "a research team

led by the US Centers for Disease Control and Prevention (CDC) has estimated the global death toll from the 2009 H1N1 influenza pandemic at more than 284,000".[11]

In Canada, there were 40,185 laboratory-confirmed cases of Infuenza A H1N1, with 8,678 hospitalized, and 428 Canadians died with H1N1.[12]

The World Health Organization did not recommend travel restrictions related to the outbreak of the influenza A(H1N1) virus.[13]

Transport Canada's Civil Aviation Contingency Operations (CACO) "can divert an aircraft, restrict airspace, facilitate the exchange of information among stakeholders, and make recommendations to airlines regarding the cancellation of flights to and from international destinations with known contagious disease outbreaks."[14] This group developed and released the *Civil Aviation Contingency Plan for Pandemics and Communicable Disease Events* in March 2010.[15] Six airports were named as quarantine sites with quarantine stations under the Quarantine Act (2005): Calgary International Airport; Halifax/Stanfield International Airport; Montréal/Pierre Elliott Trudeau International Airport; Ottawa/Macdonald-Cartier International Airport; Toronto/Lester B. Pearson International Airport; and Vancouver International Airport.[16]

Ebola (2013-2016)

There was a lengthy and large outbreak of Ebola between 2013-2016. The World Health Organization reported in January 2016 that there had been 28,602 "confirmed, probable or suspected cases of Ebola virus disease, including 11,301 fatal cases".[17]

No confirmed cases of Ebola were ever reported in Canada, although by mid-October 2014, 25 Canadians had been tested.[18]

The International Civil Aviation Organization (ICAO) chaired the Joint Ebola Travel and Transport Task Force with membership from the World Health Organization (WHO), the International Maritime Organization; the United Nations World Tourism Organization; the International Air Transport Association (IATA), the Airports Council International (ACI), the Cruise Lines International Association; and the International Chamber of Shipping. It issued a report on October 23, 2014 stating "The Committee reiterated its previous recommendation that there should be no general ban on international travel or trade because: (a) it would cause economic hardship; and (b) this may consequently increase the uncontrolled migration of people from affected countries, thereby raising the risk of international spread."[19]

Canada had been unhappy with the WHO travel advisories and the negative impact on foreign travel to Canada during the SARS outbreak and Canada was a signatory to the revised International Health Regulations which came in to effect in 2007. One "of the core tenets of the International Health Regulations has been an emphasis on avoiding "unnecessary interference with international traffic and trade""[20].

Somewhat surprisingly, on October 31, 2014, in the absence of any WHO, ICAO or IATA demand for a general ban on travel, Canada followed Australia's example in "suspending the issuance of visas for residents and nationals of countries with "widespread and persistent-intense transmission" of Ebola virus disease. As well, work on permanent residence applications for people from the affected countries is also being suspended."[21] While Canada was not alone in such actions with at least 57 other countries having entry bans, large countries such as China, France, Russia, United Kingdom and the United States did not institute such travel bans.[22]

Interestingly, the day before Canada instituted the travel restrictions, Transport Canada issued a Ship Safety Bulletin on the Ebola Virus stating "The purpose of this SHIP SAFETY BULLETIN is to provide information and guidance, based on recommendations developed by the Public Health Agency of Canada and the World Health Organization (WHO), concerning the current outbreak of Ebola virus disease (EVD) in West Africa" also noting "The public health risk posed by EVD in Canada is considered very **low** at this time".[23]

On November 25, 2014, Health Canada's Specialized Health Services Directorate issued an Occupational Health Advisory on the Ebola Virus Disease describing procedures for travellers returning to Canada from countries with active cases of Ebola.[24]

- "Under the *Quarantine Act*, when arriving in Canada, all travellers must disclose to a Border Services Officer (BSO) if they have, suspect to have, or have been in close proximity with someone who has a communicable disease. Ebola specific enhanced measures have been put in place at Canada's borders. As part of the new measures, BSOs refer all travellers who have, in the past 21 days, been in Guinea, Liberia, Sierra Leone, or Mali or those who have had contact with a person with Ebola, to a Quarantine Officer for a detailed screening, including a temperature check. The Quarantine Officer will determine further measures to be taken with these travellers under the *Quarantine Act*, based on an assessment of symptoms and risk of exposure to Ebola.
- Additionally, these travellers will be provided with an Ebola Self-Monitoring Kit that includes a thermometer and instructions for self-monitoring for symptoms of Ebola for up to 21 days following entry into Canada and what the traveller should do if symptoms develop.
- Those travellers who are determined to be exhibiting symptoms compatible with Ebola will be required to undergo a medical examination and sent to a medical facility for isolation and investigation."[25]

Although Canada had been unhappy with how it had been treated in the earlier SARS outbreak with the issuance by the World Health Organization of travel advisories to Toronto, it seems that fear trumped Canada's previous position and Canada instituted restrictions on travel from countries with the Ebola outbreak.

Middle East Respiratory Syndrome [MERS] (2012-2017)

Between 2012 and the 21st July 2017, there were 2,040 laboratory-confirmed cases of Middle East respiratory syndrome-coronavirus (MERS-CoV) infection reported to the World Health Organization, "82% of whom were reported by the Kingdom of Saudi Arabia… cases have been reported from 27 countries in the Middle East, North Africa, Europe, the United States of America, and Asia….at least 710" deaths were reported.[26] There were no deaths reported in Canada.

The Public Health Agency of Canada issued the following on May 3, 2016 "The risk to Canadians is low. This virus does not spread easily from person to person and the risk of exposure is primarily in the affected Middle Eastern countries.

The current understanding of MERS-CoV is that it has entered the human population from direct or indirect contact with infected camels or camel-related products (e.g. raw camel milk)."[27]

The World Health Organization did "not recommend the application of any travel or trade restrictions or entry screening related to MERS-CoV".[28] .As the risk of spread appeared low and as there were few direct travel connections between Canada and the affected regions, there were no actions taken by Canada as a result of the MERS outbreak that affected travel.

Canadian Adjustments to the Handling of Outbreaks

There was enough concern after the H1N1 outbreak that both the Senate of Canada and the newly formed Public Health Agency of Canada did assessments on how the two outbreaks were handled in Canada although neither seemed to have had any focus on the travel or transportation aspects of the outbreaks.[29] This does not mean that there were no changes that impacted travel with respect to outbreaks. The most evident change made in Canada after the SARS outbreak was the creation of the Public Health Agency of Canada. "The Public Health Agency of Canada (the Agency) was created in September 2004 as a key federal initiative to enhance Canada's ability to mount a coordinated and effective response to infectious disease outbreaks."[30]

PHAC along with the Chief Public Health Officer "outlines measures that the Government of Canada may take in area of public health, including health protection and promotion, population health assessment, health surveillance, disease and injury prevention and public health emergency preparedness and response. These public health measures may be accomplished through; collaboration with other public health bodies in order to coordinate federal policies; cooperation and consultation with provincial and territorial governments; and, cooperation with foreign governments and international organizations and other interested parties."[31]

Many steps have been taken to establish memoranda of understanding and procedures among the many federal and provincial players that had not been present during the SARS outbreak. Among these are the Federal/Provincial/Territorial MOUs on:

- The Sharing of Information During a Public Emergency;
- The Provision of Mutual Aid in Relation to Health Resources During an Emergency Affecting the Health of the Public, and
- Roles and Responsibilities in Pandemic Influenza Preparedness and Responses – 2009 H1N1 Outbreak.[32]

Earlier in this paper, reference was made to the World Health Organizations International Health Regulations which were updated post-SARS. "The regulations require signatory countries, including Canada, to report to the WHO public health events that have the potential to cross borders and threaten people worldwide, and to strengthen their core capacity for public health surveillance and response. The [Public Health] Agency [of Canada] acts as the focal point for coordinating the implementation of the IHR in Canada."[33]

While it does not appear that the Public Health Agency and Canada properly followed the International Health Regulations during the Ebola outbreak when Canada imposed travel restrictions in the absence of calls for this from the World Health Organization, this appears to have been an outlier. A more measured and coordinated response appears to have been encountered with the other outbreaks examined.

In the Auditor General's 2008 Report it was acknowledged that "The [International Health] Regulations contain several specific requirements for member countries, some of which will be difficult to implement for countries like Canada that operate a federal system, where the responsibilities for public health are shared and a pan-Canadian effort and commitment will be required…. The Agency has also obtained general support from all of the provinces and territories for implementing the *International Health Regulations* in Canada. This support is critical to the successful implementation of these Regulations."[34]

Endnotes

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